

# PESTICIDE USAGE DATA SOURCES OVERVIEW



# The Importance of Pesticide Usage Statistics

- Reflects actual observed agricultural and non-agricultural practices
- Helps to *realistically* characterize risk
  - **Compare** label use to actual usage practices
  - **Refine** risks and benefits
  - **Support** decision making

# Who Collects Usage Data?

- USDA NASS
  - CADPR
  - Kynetec
  - Kline
- 
- BLM
  - Few Other States
  - Some crop associations
  - Some chemical producers

Sources below line, can provide data, but metadata is limited

# Primary Sources for National Level Pesticide Usage Data

## ■ Agricultural

- *USDA Census of Agriculture (public)*
- *USDA NASS (public)*
- *CADPR (public)*
  - *(for Crops >80% grown in CA)*
- *Kynetec (proprietary)*

## ■ Non-agricultural

- *Kline (proprietary)*

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almost all of the country's almonds, apricots, dates, figs, kiwi fruit, nectarines, olives, pistachios, prunes, and walnuts are produced in California

## Deliberative Process / Ex. 5



# Quality Requirements

- **EPA Quality System Policy (CIO 2106.0)**
- Documented quality assurance procedures
  - Statistical methodologies
  - Sampling plan (survey design)
  - ***Credibility, Comparability, Relevance, Completeness***
- USDA NASS
  - [https://www.nass.usda.gov/Publications/Methodology\\_and\\_Data\\_Quality/Index.php](https://www.nass.usda.gov/Publications/Methodology_and_Data_Quality/Index.php)
- CADPR
  - [www.cdpr.ca.gov/docs/pur/purmain.htm](http://www.cdpr.ca.gov/docs/pur/purmain.htm)
- Proprietary Sources (Kynetec, Kline)
  - *Quality Management Plans*
  - *Statement of Data Quality*

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The Agency-wide Quality System (CIO 2106.0) designed to ensure that decisions are supported by data of the type and quality needed and expected for their intended use. The policy covers a broad range of environmental data and information, including secondary data. Consistent with this policy, OPP uses best available data for its work.

Fitness for Use Evaluation - Does the quality as defined by the data producers and understood by the data user support the decisions to be made?

Credibility, Comparability, Relevance, Completeness

# Publicly Available Sources

## ■ USDA

- Census of Agriculture

**CENSUS OF  
AGRICULTURE**  
YOUR VOICE. YOUR FUTURE. YOUR OPPORTUNITY.

- National Agricultural Statistics Service



## ■ CADPR



# Census of Ag Survey

## ■ Scope:

- Complete count of U.S. ag operations
  - everyone who produces >\$1000 of commodity in a survey year
- Conducted every five years
- For each commodity
  - Who produces
  - Where produced
  - How much produced
  - How is it produced

## ■ Benefits:

- It's publicly available
- Uniform, comprehensive, impartial

## ■ Limitations:

- Does not include pesticide information
- Only conducted every five years



# NASS Survey

## ■ Scope:

- 90 Use Sites
- 42 States
- 731 Als

## ■ Program state selection:

- Ensure  $\geq 80\%$  coverage of target commodity acreage
- Top-producing states, to minimize the total number of states selected.

## ■ Reporting

- ~ Every other year (depending on study)
- At program state level
- Aggregated across all program states

Methodology documented on its website.



# BENEFITS of NASS Data

- **It's publicly available**
- Crops only surveyed by NASS on the national level
  - *blueberries, eggplant, honeydew, oats, and specific caneberries (blackberries and raspberries)*
- Helps to validate data from other sources

In addition to EPA, information is used by:

- \* Other Federal Agencies
- \* Academia
- \* Industry
- \* Farming/Grower Community



# Limitations of NASS Data

- NASS does not report:
  - *Usage data for crops on a yearly basis*
  - *Pest linked data*
  - *Total Acres Treated*
  - *Sample sizes*
  - *Seed treatment data*
  - *Non-agricultural usage data*
  - *Some Studies discontinued/dated*

Post harvest  
Nursery/floriculture

Some larger crop groups, like tree nuts, aren't surveyed

# CADPR Survey

## ■ Scope:

- Census
- Complete reporting from
  - Agricultural applicators
  - Professional pesticide applicators
- All AIs used
- All use sites treated

## ■ Reporting:

- *Reported continually*
- *Published annually*

CADPR receives monthly reports from county ag commissioners who require growers to report their use of pesticides.

# BENEFITS of Using CADPR Data

- It's publicly available
- The full use reporting program =
  - *comprehensive state usage data*
- Many crops grown almost exclusively in CA =
  - *comprehensive crop usage data*
- Helps to validate data from other sources

In addition to EPA, information is used by:

- \* Other Federal Agencies
- \* Industry
- \* Grower Groups
- \* Chemical Manufacturers

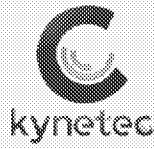


# Limitations of CADPR Data

- CADPR does not report:
  - Pest linked data
  - Homeowner usage information
  - Seed treatment data

# Proprietary Data Sources

## ■ Kynetec



# Kynetec Survey

## ■ Scope:

- Cover 60 unique crops (grown on 390+ Mill acres)
  - Herbicides –60 crops
  - Insecticides - 57 crops
  - Fungicides - 53 crops
  - Nematicides - 45 crops
  - Growth Regulators - 11 crops
- Reports usage for 389 Als

## ■ States:

- 45 States surveyed for one or more
- Target 95% coverage of target row crop acreage
- Target 80% coverage of specialty crop acreage

## ■ Reporting:

- Updated annually

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### Survey Design

targeted for pesticide type and crop

to collect optimum sample size and acreage

designed to select potential respondents with some overlap between years

administered through web surveys, computer-assisted telephone interviews, focus groups and face-to-face interviews  
collected at product level;

AI information is post processed

Large producers are oversampled

Data are weighted to correct for possible bias from oversampling

Data are projected at state and/or CRD levels to represent total universe of growers

# BENEFITS of Using Kynetec Data

- Our most complete and adaptable data set
- Provides:
  - Major crop usage
  - Major growing state usage
  - Only source for pest specific information
- *Huge* database in iMap.
  - Can be dynamically analyzed/aggregated
  - VS NASS and CDPR's static data elements
    - *must be combined and manipulated in excel/access,*
    - *can be difficult because of how the data is reported.*

# Limitations of Kynetec Data

- **Data are proprietary**

- Can't be shared/published without aggregating and masking

- **Does not report:**

- Data on smaller market crops
- Smaller market states aren't surveyed for all crops
- *Sub-state level data aren't statistically significant*
  - Data are provided, but usually shouldn't be used
- Survey of seed treatment ended in 2014
- Sugar cane survey ended in 2016
- Non-agricultural sites aren't surveyed

# High Consumption Crops not Surveyed at the National Level

- Beets
- Cactus
- Cashew
- Cassava
- Collards
- Cranberries
- Endive
- Honey
- Hops
- Limes
- Maple syrup
- Mushroom
- Okra
- Onion, green
- Papaya
- Pineapple
- Plantain
- Radishes
- Rye
- Safflower
- Spices, other
- Sweet Potatoes
- Tomatillo
- Turnips
- *Many other lower consumption crops*

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+++++ more

# Non-Agricultural Data

■ Kline

eKline

# Kline Survey

## ■ Scope:

- Non-ag market information
- Combo of structured survey and unstructured expert interviews
- We purchase 9 studies

## ■ Location selection:

- Sampling frame influenced by market size and share information

## ■ Reporting

- ~ *Every other year (depending on study)*
- *National level*
- *Regional available for some studies*

Data items published include:

Consumer Pesticides and Fertilizers  
 Professional Turf and Ornamental Markets for Pesticides and Fertilizers  
 Professional Pest Management Markets for Pesticides  
 Pest Control in Food Handling  
 Industrial Vegetation Management  
 Mosquito Control Market  
 Stored Grains Market  
 Biopesticides  
 Specialty Biocides



# Benefits of Kline's Data

- **Our only source of non-agricultural data**
- Variables include acres treated, pounds a.i. applied, sample size, sales data by a.i. and product
- Narrative descriptions of data

In addition to EPA, information is used by:

- \* Commodity Groups and Chemical Manufacturers
- \* USGS
- \* NGOs
- \* Universities
- \* Other Gov't Groups

# Limitations of Kline Data

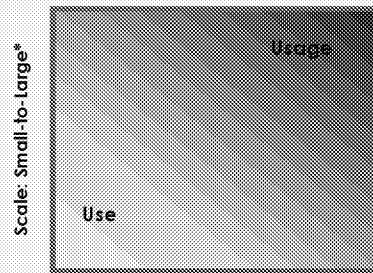
- **Data are proprietary**
  - Can't be shared/published without aggregating and masking
- **Mostly national scale**
  - *Regional market share data for IVM and T&O*
  - *Mosquito studies reported at the mosquito abatement districts (MADs) level*
- **Not all data elements are always available for each AI.**
  - *Studies are conducted based on market interest rather than a specific frequency*

# Usage Data Applications

# Scale and Objectives

\*This is a gradient, and should not be viewed as dichotomous.

- Generally, as you move from a small to a larger scale, usage data generally become more appropriate.
- There may be times when usage data are useful at the individual field-scale.



Exposure: Hypothetical-to-Likelihood

Use  Usage  
Scale: Small-to-Large\*

Use  Usage  
Exposure: Hypothetical-to-Likelihood

# Step 1

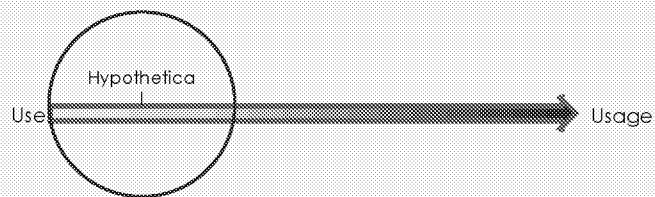
**Is there a potential for an individual to be impacted?**

Use data are appropriate

It is hypothetically possible for a use site to be treated at the maximum application rate and for an individual to be exposed to that maximum rate.



**Max  
Rate**

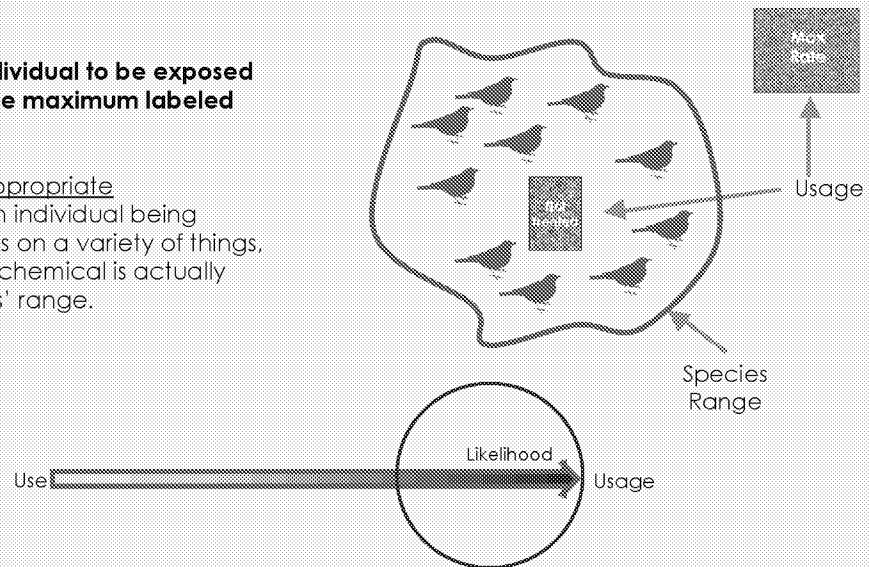


## Step 2

**Is it likely for an individual to be exposed to a pesticide at the maximum labeled rate?**

Usage data are appropriate

The likelihood of an individual being impacted depends on a variety of things, including how the chemical is actually used in the species' range.



# Step 3

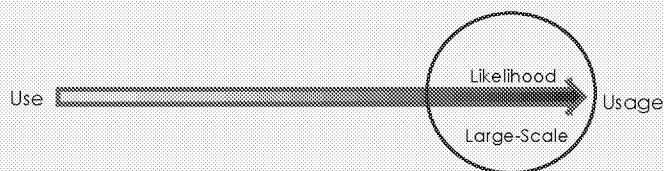
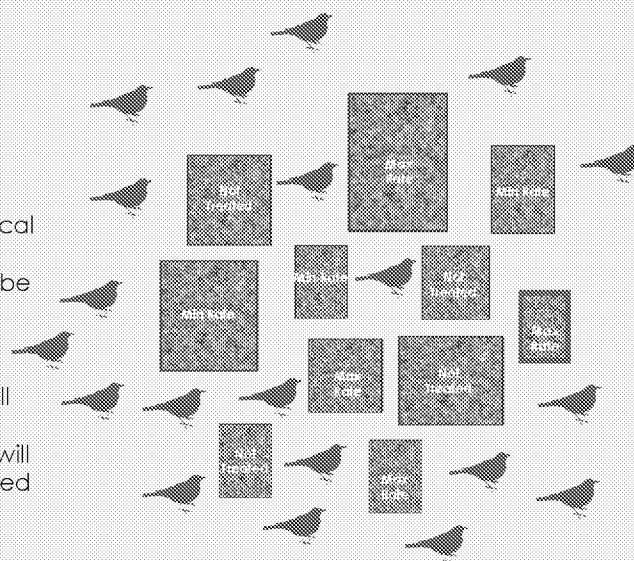
**What is the likelihood of adverse effects to the population?**

**Usage** data are more appropriate

The likelihood depends on how the chemical is actually used in the species' range.

In reality, it is not likely that a pesticide will be applied

1. On all potential use sites in a geographic area,
2. At the maximum labeled rate on all treated use sites,
3. That all individuals in a population will be exposed at the maximum labeled rate.



# The Result of Not Incorporating Usage Data

- Chlorpyrifos Example:
  - Final BE and BO assume that every potential use site has an application at the maximum labeled rate
  - The math:
    - **1,156,000,000 acres of potential agricultural use sites** in the continental US for chlorpyrifos (including cropland, pasture, and rangeland)
      - Based on the CDL data used in the BE and BO
    - **If we assume an application of 1 lb a.i./acre for each potential use site** (which is less than the maximum labeled rate for most chlorpyrifos agricultural uses), it means that **> 1 billion lbs of chlorpyrifos** is applied in one year—for just for ag uses
    - **2.4 billion acres of potential mosquito adulticide and 'wide area' uses** in US, then we'd assumed that **>2.4 billion lbs of chlorpyrifos** is used in one year

*For ag and non-ag combined, assuming just a single application below the maximum label rate, we'd assume >3.4 billion lb of chlorpyrifos are applied annually*



# Use Assumptions

- Chlorpyrifos Example:
  - *Based on average annual Chlorpyrifos usage data:*
    - < 8 Million lb are used in the US (on ag crop sites)
    - < 14 Thousand lb are used in the US (mosquito control)
  - *Based on average annual insecticide usage data:*
    - Approx. 60 Million lbs of insecticides are used in all sectors
  - *The math:*

*By relying on use data, we are assuming that orders of magnitude more chlorpyrifos is being used per year than all insecticides combined.*

# Use Assumptions

## ■ Chlorpyrifos Example:

- Example from the Final BO
- Atlantic Sturgeon, Chesapeake Bay DPS (p. 12-378):

Yellow highlighted rows = use layers that represent several specific uses; a low-end application rate was used

This was repeated randomly with a few other species:

- Steelhead, Middle Columbia River DPS (p. 12-237) =
  - **26,556,499** (single)
  - **277,618,927** (annual)
- Nassau Grouper (p. 12-455) =
  - **2,188,249** (single)
  - **22,264,996** (annual)

USE	SINGLE MAX APP RATE (lb a.i./acre)	ANNUAL MAX APP RATE (lb a.i./acre)	ACRES IN RANGE	MAX USE (SINGLE APP)	MAX USE (YR APP)
Alfalfa (Pasture)	1	4	846299	846299	3385196
Rights-of-way	1	2	1759861	1759861	3519722
Managed Forest	1	6	1673965	1673965	10043790
Developed	1	2	1071924	1071924	2143848
Corn (all)	3	8.1	870396	2611188	7050207.6
Cotton	1	3.2	31329	31329	100252.8
Other crops	1	2	88888	88888	177776
Golf courses	1	2	52843	52843	105686
Vegetables and ground fruit	1	2	27884	27884	55768
Other grains	1	2	14921	14921	29842
Nurseries	1	2	9026	9026	18052
Other row crops	1	2	5249	5249	10498
Orchards and vineyards	1	2	1573	1573	3146
Christmas trees	2.5	5.5	1169	2922.5	6429.5
Mosquito Control	0.01	0.26	13857315	138573.15	3602901.9
Soybean	2.2	3	1109459	2440809.8	3328377
Wide Area	1	12	13857315	13857315	166287780
Wheat	1	12	18808	18808	225696
<b>TOTALS (lbs)</b>				<b>24,653,378</b>	<b>200,094,969</b>

# Use Assumptions

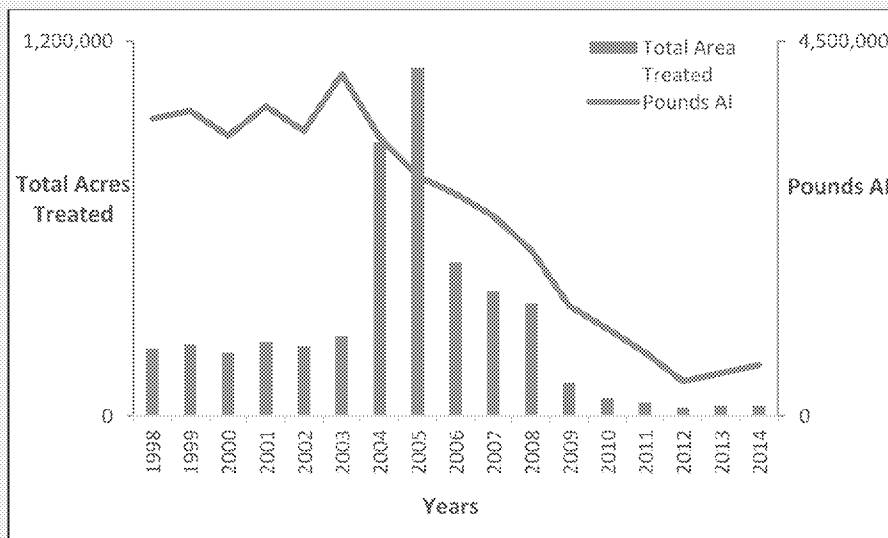
- By relying on **USE** data only in the BEs and BOs we are clearly significantly over-estimating the likelihood of exposures (and, thus, risks)
- **USAGE** data can help inform an understanding of the likelihood of exposure at a field- and geographic-scale

# Questions?

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ADD IN RED DATE

# Usage Trend



**Figure 1. Diazinon Total Acres Treated and Total Pounds A.I. Applied (1998-2014).**

Source: Market Research Data (MRD). 1998-2014

ADD IN RED DATE

# National Ag Usage

**Table 1. National Diazinon Agricultural Usage by Crop. Data Averaged Over Reported Years.**

Crop	Survey Status	Avg. Annual Pounds AI Applied*	Avg. Annual Total Acres Treated <sup>2</sup>	Avg. AI Rate	Max Labeled Rate
Cucumbers	MRD (2010-2014)	1,590	1,130	1.41	4
Apricots	MRD (2010-2014)	Insufficient number of reports to establish an estimate.			2
Hazelnut	MRD (2010-2014)	Surveyed but no usage reported			0.5
Beets (Red and Table)	Not Surveyed at National Level				4

Usage compared to Max Label Rate

Lbs, TAT, Rate

averaged over the number of years of available survey data based on sampling frequency (five years for MRD and CDPR, and 1-2 years for NASS), regardless of whether usage is observed in each surveyed year.

Hide small sample

Show not surveyed

# State Ag Usage

**Table 2. Diazinon Agricultural Usage by Crop and State.**

Crop	Survey Status	State	Avg. Annual Crop Acres Grown <sup>1</sup>	Avg. Annual Total Lbs. AI Applied	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Cucumbers	MRD (2010-2014)	California	8,300	400	0	11	7
		Florida	24,500	(S)	0	5	2
		GA, MD, MI, MO, NC, SC, TX, WA, WI	Surveyed but no usage reported				
Blueberries	NASS (2011)	Washington	7,758	2,600	34	47	41
		Georgia	11,565	3,350	23	25	24
		Oregon	8,484	950	16	17	17
		New Jersey	8,802	800	8	19	14
		Michigan	18,776	Insufficient number of reports to establish an estimate.			
		North Carolina	5,776	Insufficient number of reports to establish an estimate.			
Figs	CADPR (2010-2014)	California (96%)	6,787	208	0	7	2.7
Beets (Red and Table)	CADPR (2010-2014)	California (12%)	2,730	160	0.4	1.6	0.8
		Other states (88%)	Crop grown in other states, but not surveyed at national level				

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By state  
Where observed  
Where surveyed but not obs  
For CA data, show % not grown in CA  
CAG, Lbs, Min/Max/Avg PCT  
PCT = TAT/CAG

Mask small sample size

# Non-Ag Usage

Table 3. Diazinon Non-Agricultural Usage by Site. 2009.

Crop	Survey Status	State	Avg. Annual Total Lbs. AI Applied	Percent of Operations 2006	Percent of Operations 2009
Ornamentals grown in outdoor nurseries (trees, bushes, herbs, nonflowering plants, flowers, shrubs, vines)	NASS (2006, 2009)	California	---	11	23
		Florida	---	3	3
		Pennsylvania	---	3	3
		Oregon	---	5	1
		Texas	---	14	1
		Michigan	---	2	Insufficient number of reports to establish an estimate.
Cattle	Not Surveyed				

Diff depending on source



# Non-Ag Usage

**Table 3. National Carbaryl Non-Agricultural Usage by Crop. Data Averaged Over Reported Years.**

Crop	Survey Status	Avg. Annual Pounds AI Applied <sup>a</sup>	Avg. Annual Total Acres Treated <sup>b</sup>	Max Single Labeled Rate <sup>c</sup> (lb AI/A)
Household/Domestic Dwellings Outdoor Premises <i>Applied by Consumers</i>	NMRD (2010, 2012)	3,489,000	—	9.0
External Pest Treatments <i>Applied by Pest Management Professionals</i>	NMRD (2012)	6,600	—	9.0
Ornamentals (Unspecified): <i>Covers Trees and Plants, Woody Shrubs and Vines grown in Nurseries</i>	NMRD (2012)	36,000	9,000	2.0
<b>Ornamental Lawns &amp; Turf</b>	<i>See Sector usage below</i>			
<i>Applied by Lawn Care Operators</i>	NMRD (2012)	77,000	19,000	8.36
<i>Applied by Landscape Contractors</i>		13,000	11,000	
<i>In Institutional Turf Facilities</i>		9,000	7,000	
<i>Golf Courses</i>		127,000	24,000	8.0
<i>Ornamental Sod Farm (Turf)</i>		30,000	6,000	8.16
Forest Trees (All or Unspecified): <i>Covers Forested Areas and Rangeland Trees</i>	Not Surveyed at National Level**			2.0
Non-Cropland Uses: <i>Covers Conservation Reserve Program (CRP), Set Aside Program, Acreage, Wasteland, Rights of Way, Hedgerows, Ditch banks, Roadsides.</i>	Not Surveyed at National Level**			1.02

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Diff depending on source